CLAIMS

WHAT IS CLAIMED IS:

1.   A modeling system for modeling an object, comprising:

at least one camera;

an image grabber that captures a two dimensional (2D) image of the object;

a scanner that scans the object to create a three dimensional (3D) image of the object; and

at least one image processor that breaks the 2D image into geometric elements and matches the scanned 3D image with the geometric elements to generate the model.

2.   The modeling system of claim 1, wherein the 2D image is a 2D gray-tone image and the 3D image is a 3D stereoscopic image.

3.   The modeling system of claim 1, wherein said at least one camera comprises two cameras in a spaced spatial relationship.

4.   The modeling system of claim 1, wherein said at least one image processor comprises a first image processor that breaks the 2D image into the geometric elements and a second image processor that matches the 3D image with the geometric elements.

5.   The modeling system of claim 1, further comprising a memory accessible by said at least one processor, wherein the memory stores a geometric element standards library reflecting geometric element characteristics and wherein said at least one image processor validates the geometric elements by referencing the library.

6.   The modeling system of claim 1, wherein said at least one image processor further generates a correction matrix reflecting distortion between the 3D image and the geometric elements, wherein said at least one image processor corrects the 3D image based on the correction matrix.

7. The modeling system of claim 1, wherein the scanner is a laser projector that projects a plurality of illuminated stripes on the object.

8. The modeling system of claim 1, further comprising at least one movable platform supporting at least one of said at least one camera and the object to move said at least one camera and the object relative to each other.

9.   A method of generating a model of an object, comprising:

capturing a two dimensional (2D) image of the object;

scanning the object to create a three dimensional (3D) image of the object;

breaking the 2D image into geometric elements; and

matching the 3D image with the geometric elements to generate the model.

10.   The method of claim 9, further comprising validating the geometric elements with a geometric element standards library reflecting geometric element characteristics, wherein the validating step is conducted before the matching step.

11.   The method of claim 9, further comprising:

determining a difference between the 3D image and the geometric elements;

generating a correction matrix based on the difference to reflect any distortion between the 3D image and the geometric elements; and

correcting the 3D image based on the correction matrix.

12.   The method of claim 9, wherein the scanning step comprises projecting a plurality of illuminated stripes on the object and capturing at least one image of portions of the object illuminated by the stripes.

13.   The method of claim 12, wherein the projecting step projects the illuminated stripes at a first set of locations, and wherein the scanning step further comprises projecting the plurality of illuminated stripes on the object at a second set of locations different than the first set of locations and capturing at least one image of portions of the object illuminated by the stripes in the second set of locations.

14.   The method of claim 9, wherein the 3D image comprises at least one point cloud, and wherein the matching step comprises:

segmenting said at least one point cloud into a plurality of point cloud segments; and

matching each of the plurality of point cloud segments with one of the geometric elements,

and wherein the method further comprises merging the plurality of point cloud segments to generate the model.

15.   The method of claim 9, further comprising controlling a scanning speed based on information from the breaking step.

16.   The method of claim 9, wherein the 3D image comprises at least one point cloud, and wherein the matching step further comprises at least one of removing outliers and reducing point density in said at least one point cloud.